

## Lightweight Exit Cone for Liquid Rocket Engines, Phase I

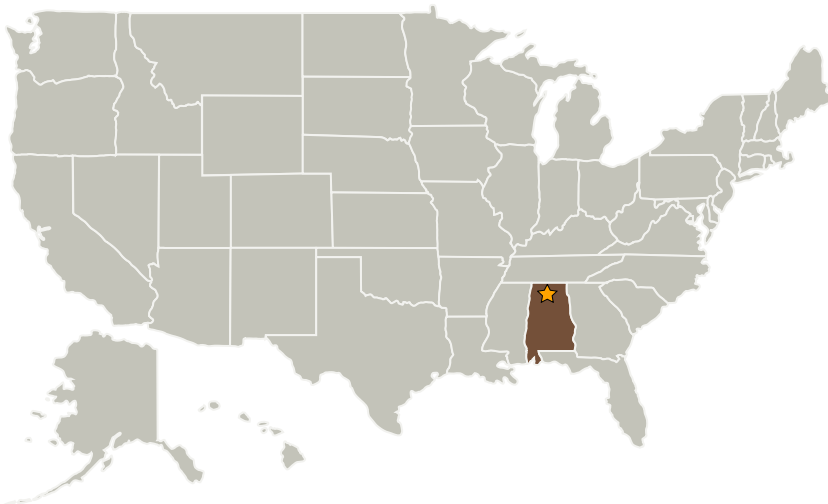
Completed Technology Project (2008 - 2008)



## Project Introduction

The Pratt and Whitney Rocketdyne (PWR) J-2X engine will power the upper stage of the Ares I and the earth departure stage (EDS) of the Ares V, which will enable manned travels to the Moon and eventually Mars. Building on Apollo heritage, the J-2X is a derivative of the J 2 engine. One unique feature of the J-2X is its planned carbon/carbon (C/C) composite nozzle extension, which will replace the heavy metallic extension and increase engine performance. Currently, NASA and PWR plan to employ a Noveltex or Naxeco C/C nozzle extension from a foreign supplier on the J-2X. Plasma Processes Inc., with the support from ATK Launch Systems, proposes a program with the primary goal of demonstrating a domestically produced C/C composite nozzle extension for use on the J-2X. The specific objectives include evaluation of higher strength C/C materials and manufacturing methods, investigation of oxygen protective coatings and design of nozzle extension subcomponent. The team of Plasma Processes, Inc. and ATK Launch Systems offers a state of the art skill set that is uniquely suited to the Phase I program.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Marshall Space Flight Center (MSFC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center (MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Plasma Processes, LLC	Supporting Organization	Industry Veteran-Owned Small Business (VOSB)	Huntsville, Alabama

## Primary U.S. Work Locations

Alabama

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Daniel Butts

## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - └ TX01.3 Aero Propulsion
    - └ TX01.3.1 Integrated Systems and Ancillary Technologies